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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,917	12/21/2001	Joachim Arlt	PR-39	7062

7590 05/30/2006

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ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 05/30/2006

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/026,917
Filing Date: December 21, 2001
Appellant(s): ARLT ET AL.

Klaus P. Stoffel
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 23 February 2006 appealing from the Office action mailed August 29, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

USP 6,238,160	Hwang et al.	29 May 2001
USP 6,444,033	O'Mara et al.	03 September 2002
USP 6,354,791	Wytman et al.	12 March 2002
USP 5,815,366	Morita et al.	29 September 1998

USP 5,948,986 Brown 07 September 1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 6, 7, 9 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Hwang et al. (US 6,238,160). Hwang et al. show method of manipulating semiconductor substrates comprising placing a semiconductor substrate (26) on a transportable electrostatic chuck (38), and keeping the semiconductor substrate clamped on the electrostatic chuck (38) for the duration of and between at least two processing steps (backside cooling and any of CVD, sputtering, etching, etc., see col. 5, lines 39-61) of the semiconductor substrate (26) without any additional external power supply to recharge the transportable electrostatic chuck during long or several process steps or operation steps. Note at col. 5, lines 25-41 that two processing steps are carried out, those being relatively moving the arm and wafer and then rapidly moving the arm into the process chamber under a single power application.

The method comprises electrically charging and/or discharging the transportable electrostatic chuck separately in one or more mobile or stationary transfer stations. Note that any such carrier will have to be charged while it is still or moving, there are simply no alternatives.

The method further comprising recharging or discharging the electrostatic chuck in a charging station of a processing machine. See the discussion at col. 2, lines 25-42 in which it is noted that a second electrostatic force is removed after processing in a chamber, then the wafer is moved, i.e. transported.

The transportable electrostatic chuck is used in a unipolar (fig. 2) or bipolar (fig. 5) electrostatic system. See also col. 1, lines 49-53.

Hwang et al. show (fig. 2) an electrostatic carrier system for manipulating semiconductor substrates, the system comprising at least one transportable electrostatic carrier (38) for a semiconductor substrate (26) and at least one transfer station for transferring the transportable electrostatic carrier (38) with the semiconductor substrate (26) place thereon between processing steps. See col. 2, lines 24-42.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (US 6,238,160) in view of O'Mara et al. (US 6,444,033). Given the invention of Hwang et al., as noted above, the thickness of their transportable electrostatic chuck is unknown. O'Mara et al. shows (fig. 8) a transportable electrostatic chuck (304) that has a thickness of 0.3 – 2.5 mm. O'Mara et al. do not note that their component is explicitly used to process semiconductor substrates.

It would have been obvious to one having ordinary skill in the art to have an electrostatic chuck in the device of Hwang et al. of a thickness on the order of that taught by O'Mara et al. at the time the Hwang et al. invention was made since this thickness allows for a flexible carrier, thus making it less likely to chip or break due to rigidity stresses.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (US 6,238,160) in view of Wytman et al. (US 6,354,791). Given the invention of Hwang et al., as noted above, they do not show their electrostatic chuck being arranged so that it is inductively charged and discharged without contact.

Wytman et al. show (e.g. fig. 2) a method of manipulating semiconductor substrates comprising placing a semiconductor substrate (W) on a transportable electrostatic chuck (16) and keeping the semiconductor substrate (W) placed on the electrostatic carrier (16) for at least some duration. They further note that their electrostatic carrier (16) is arranged so that it is inductively charged and discharged without contact. See col. 1, lines 62-63. It is not clear that the semiconductor substrate is held for at least two processing steps.

It would have been obvious to one having ordinary skill in the art to have an electrostatic chuck in the device of Hwang et al. which is inductively charged and discharged without contact as is shown by Wytman et al. at the time the Hwang et al. invention was made since the ability to do so is known in the art, thus its use involves not inventive step and since no soldering, brazing etc. is required to connect a power supply to the chuck for charging/discharging purposes, no exposed wire is associated with the movable carrier.

Claim 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (US 6,238,160) in view of Morita et al. (US 5,815,366). Given the invention of Hwang et al., as noted above, they do not show their transportable electrostatic chuck including an integrated electrical charging and/or discharging device, comprising supplying the charging and/or discharging device by a battery or an accumulator.

Morita et al. show (e.g. fig. 2) a method of an electrostatic chuck (11) including an integrated electrical charging and/or discharging device, comprising supplying the

charging and/or discharging by a battery (27) or an accumulator. It is not clear that the semiconductor substrate is held for at least two processing steps or that the electrostatic chuck is transporting the device.

It would have been obvious to one having ordinary skill in the art to have the transportable electrostatic chuck of Hwang et al. to include an integrated electrical charging and/or discharging device, comprising supplying the charging and/or discharging device by a battery or an accumulator at the time of their invention since the ability to do so is known in the art, thus its use involves no inventive step and since use of batteries provides the ability to provide for different voltage levels in applications.

Claim 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (US 6,238,160) in view of Brown (US 5,948,986). Given the invention of Hwang et al., as noted above, they do not note monitoring and/or controlling the steps of securing and/or separating the wafer from the electrostatic chuck by means of position sensors.

Brown shows (fig. 1) a method of manipulating semiconductor substrates comprising placing a semiconductor substrate (6) on an electrostatic carrier (2). Brown notes monitoring (46) and/or controlling the steps of securing and/or separating the wafer from the electrostatic carrier by means of position sensors (see abstract). Note that his monitoring unit is connected to his power supply control system, thereby the unit clearly controls the steps cited above.

Brown doesn't note the number of processing steps he intends to be performed on the semiconductor substrate (6) while it is on the chuck.

It would have been obvious to one having ordinary skill in the art to have monitoring and/or controlling of the steps of securing and/or separating the wafer from the electrostatic chuck by means of position sensors in the device of Hwang et al. such as is taught by Brown in order to assure correct positioning of a wafer so that processing is successfully achieved. See Brown's col. 8, lines 13-17.

(10) Response to Argument

The applicants contend that Hwang et al. do not disclose a transportable electrostatic chuck. The examiner in response contends that it is not clear how the applicants can ascertain that the Hwang et al. invention cannot be transported. Obviously the device will be moved from the factory at some time. Additionally, the description of the electrostatic chuck being transportable is not a positive recitation, but an indication that the device has the ability to be transported, not that it necessarily is.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Thomas M. Dougherty

TOM DOUGHERTY
PRIMARY EXAMINER

Conferees:

Darren Schuberg,

Ricky Mack